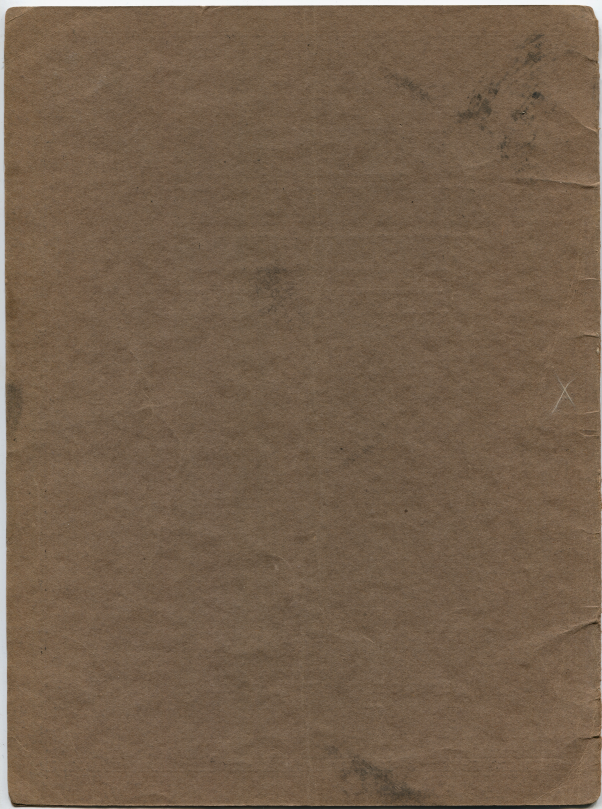


**MILLER
AUTOMATIC
FEEDERS**
Book of
INSTRUCTION

PRICE ONE DOLLAR



11733

INSTRUCTION CARE AND OPERATION MILLER AUTOMATIC PLATEN PRESS FEEDERS



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MILLER SAW-TRIMMER COMPANY
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Introduction

IN PRESENTING a book of instructions to users of Miller Automatic Feeders, many phases of an unusual nature are met. For the benefit of old users, we have outlined a systematic method of operation practiced in those shops where Miller Feeders have established maximum production records and yielded the greatest returns.

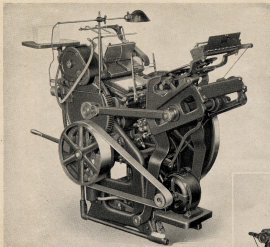
To new users of Miller Feeders we have endeavored to impart that fundamental knowledge which we believe should be acquired to eliminate initial troubles due to lack of operating experience and to insure from the start the best service and extra profits that belong to every Miller owner.

With these ideas in mind we present this instruction book beginning with the installation, and leading down to the time when experience makes it unnecessary to frequently refer to printed instructions.

It is inevitable that certain information will not be found in this book. However, our purpose is to give satisfactory information and service to every user of Miller Feeders, and should an owner fail to receive such information and service from any of our representatives, we ask in good faith to be advised.

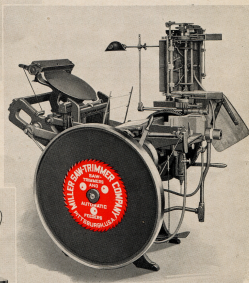
To further aid us in rendering the most efficient Miller service, it is important that you fill out the Owner's Record Card to be found inside front cover of this book and mail to us, and by so doing you will receive literature from time to time which will assist you in operating and maintaining your Miller Feeders.

Miller Saw-Trimmer Company

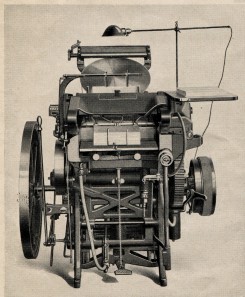


8 x 12 Miller
Ideal Unit

10 x 15 Miller
Ideal Unit



12 x 18 Miller
Ideal Unit
and
Miller
Craftsman
Unit



The Three Sizes of Miller Automatic Feeders

Instructions

Care and Operation Miller Automatic Platen Press Feeders

ALL Miller Feeders are carefully inspected and tested before shipment from the factory. Each machine is subjected to hours of continuous feeding of various grades and weights of stock ranging from and including onion-skin to heavy cardboards and coated stocks. These tests, conducted by highly skilled Miller experts, not only eliminate all possible chance of a Miller Feeder being shipped that does not measure up to the high standard of workmanship and materials specified in our guarantee, but also insure delivery of machines that will function properly and render satisfactory, continuous service in the hands of the users.

Factory Inspection and Tests

THE lubrication of the Miller Feeder is an item of great importance and once neglected can cause a vast amount of trouble, expense and loss of production. Let two parts that require lubrication become dry from lack of oil and they may become ruined and have to be replaced with new ones. Oftentimes the binding of two minor parts, due to lack of lubrication, will cause a general smash-up involving the breakage of other and more expensive parts.

Oiling

When Feeder is being installed and during the demonstration period observe closely the location of all oil holes. Oiling should be done at regular intervals, being careful that no part requiring oil is missed by commencing at the same place each time and continuing around the machine until the starting point is reached. Make sure that oil holes are clear and free from dirt and grit. If stopped up they should be thoroughly cleaned out at once.

The main parts of the machine should be oiled several times each day while the machine is new, and if any parts indicate a tendency to overheat they should be oiled more frequently. Every part that moves should be oiled even though there is no oil hole—oil it at its point of contact or bearing.

Use a good quality of mineral machinery oil of medium consistency—a free flowing oil is better than a heavy oil. Keep the machine clean by wiping off all surplus oil—a clean, well-kept machine is usually a perfect operating machine.

Operation

IT is assumed that the Feeder is properly attached to the press and after the usual demonstration period has been turned over to the operator by a Miller Saw-Trimmed Company demonstrator.

Locking Up Form

THE form should be locked so that sheet comes as near center of platen as possible. If a sheet about four by six inches or smaller, locate sheet one-half inch higher than center, and a corresponding distance to the register side guide. This will permit of ample clearance for travel of register fork and raise the sheet high enough on the platen for delivery fingers to grip the top edge. Delivery fingers may be adjusted to extend down approximately three and one-quarter inches from top of platen. If maximum size sheets are to be printed, 8 x 12, 10 x 15, or 12 x 18, the largest sheets handled by each of the three feeders respectively, the form should be locked in chase so that sheet is located on platen about one-fourth inch above center and directly in center to right and left. Thus located the feeder rack grippers will have sufficient travel to carry sheet to the feed guides and release it properly.

Raising and Lowering Feeder

WHEN placing a form in the press and to gain access to the platen for make-ready purposes, it is necessary that the feeder be raised out of operating position. To raise the feeder, turn fly-wheel until timing mark on cam wheel at left of press is exactly in line with timing pointer attached to side frame. To lower the Feeder, make sure that timing marks are in the same position as when feeder was raised, and in addition also note if feeder is in time. This can be ascertained by noting position of timing mark on the feed cam, which should line up with a similar mark on the gear housing, on the 10 x 15 size. On the 8 x 12 this timing mark will be found on the delivery cam directly underneath feeder top, and on the 12 x 18 size it will be found on the feed cam opposite the location of the timing mark on the 10 x 15. Both the press and the feeder must be in time when feeder is lowered to operating position, otherwise serious damage will result. Every operator should acquire the habit of looking at both timing marks each time the feeder is lowered.

Packing on Platen

THE platen is usually adjusted to accommodate a packing approximately forty-seven thousandths of an inch in thickness. The best impression is secured if platen is dressed with two thin pressboards fifteen thousandths thick, three or four sheets of S. & S. C. forty or fifty-pound book and a drawsheet of tympan manila six thousandths thick. It is important that the pressboards and S. & S. C. sheets are trimmed accurately to the full size of the platen except at each end where clearance must be provided for bearers on bed of press. If packing does not extend to edge at top of platen the delivery fingers coming in contact with the ridge so formed will soon wear away the top sheet causing annoyance. On extra heavy large forms it will be found necessary to add impression to the top of platen to even up the impression on all four corners. This may be quickly and easily accomplished by turning up the two top impression screws a trifle. When again placing a light form on the press the two top impression screws must be turned down to their original position. Care must be exercised in applying the packing that it hugs the platen closely and is free from wrinkles. A loose, baggy drawsheet will cause trouble and loss of register in feeding.

Make-ready

WITH feeder raised, free access to platen is permitted for make-ready, which is applied in usual way with the exception of the manner in which the feed guides are set. Before starting the make-ready the

front stock plate should be removed, thus avoiding all danger of hand or fingers being crushed between the plate and platen.

THE two bottom guides should be located 1" from each end of the sheet to be run. ($1\frac{1}{4}$ " when quads are used.) The side guide should be located half the distance between the center of the sheet and the bottom or guide edge. See Figure 1. A third guide is necessary when feeding paper, but is not always required when running cardboard. This guide is placed near the center of the sheet at the right of the register fork. With the sheet in position against the bottom guides, the center guide should be placed so that it clears the edge of the sheet about a half point. The third guide is used to prevent the stock from buckling. After careful tests of the various gauge pins on the market, we recommend the Megill Double-Grip Gauge as being the best adapted to Miller Feeder work. These gauges are carried in stock at all Miller Branches.

Setting Feed Guides

AFTER make-ready is complete and feed guides properly set as instructed in preceding paragraph, the tympan bale screws at top of platen should be tightened up, thus eliminating all possible chance of the tympan bale working up during the run. This precaution should be taken even on the shortest runs as serious damage to the feeder will result if the tympan bale should work up while the unit is in operation. You are now ready to proceed with the feeder adjustments which consist of seven simple settings described and illustrated as follows:

Tympan Bale Screws

RIGHT and left registering devices are supplied as standard equipment; also two sets of register forks, one set designed for paper stocks and one set for cardboard. Each set consists of four lengths, three, four, five and six inches respectively. The left registering device, as shown in Figure 1, which registers the sheet to a left-hand guide, is the one commonly used in feeding the general run of work. The right registering device, which registers the sheet to a right-hand guide, is employed when impression on reverse of sheet must register in backing-up. The left register is usually fitted to the last hole in the register bracket to the right, while the right register is fitted to the last hole to the left. The extra holes in register bracket are provided for emergencies.

Register and Register Fork

*Setting No. 1
Figure 1*

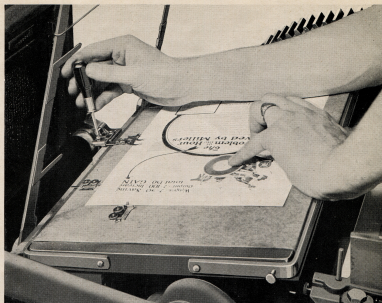
The paper register fork is designed for light weight stocks such as bonds, ranging from thirteen to twenty-four pounds, flat papers of corresponding weights, and light and medium weight book papers. Cardboard register fork is designed for the heavier book papers, cover stocks and cardboards and is also adapted to feeding onion-skin by adjusting the spring tongues to the proper tension.

When selecting register fork for the job in hand, choose length that will not project more than one-quarter inch beyond the bottom of the registering device. When properly adjusted, it should extend up on the platen just far enough to bring the heel of the fork to within a

Setting No. 1

Adjusting
Register
Fork
(Feeder Raised)

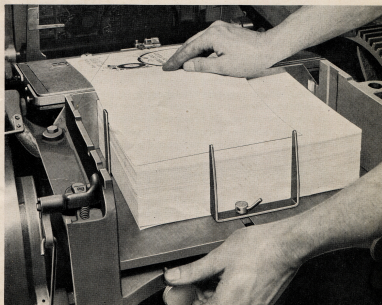
Figure 1



Setting No. 2

Adjusting
Stock Guides
on Stock Table
(Feeder Raised)

Figure 2



point of the feed guide edge of the sheet. Having selected the proper style and length of register fork, next make sure that the fork does not exert too much tension on the sheet. Adjust by springing the two outer prongs on the paper fork or, if cardboard fork is used, by springing the steel tongue in center.

With either style of fork the tension on the stock should be just sufficient to carry the sheet over to the side guide, allowing the fork to disengage itself without wrinkling the sheet or causing it to rebound from the guide. A simple test is to feed the sheet to the bottom guides and depress the grippers, noting the results. If the sheet does not carry over properly as grippers are depressed quickly the tension should be increased. If on the other hand the sheet buckles and rebounds when released by the register fork, the tension should be relieved. In all cases make sure the sheet slides freely on bottom feed guides.

Proper adjustment of forks requires some patience and experimenting. Experience is the best teacher.

REPLACE the front stock plate in position and place a pile of stock on the stock table as shown in Figure 2. Feed a sheet to the bottom guides and to within about one-eighth inch of the side guide; line up another sheet with the sheet on the platen, allowing it to extend back over the stock table, which establishes the line to which the left hand stock guide should be adjusted, as illustrated in Figure 2. The back and right hand stock guides can now be adjusted to the edges of the pile, care being exercised that neither of these guides is set so snug as to prevent stock table from raising freely when the machine is in operation. The one-eighth inch clearance of side guide provided for in this setting is necessary to avoid sheet coming in contact with side guide as it is being carried to the bottom guides.

***Lining Up
Stock on
Stock Table***

*Setting No. 2
Figure 2*

THREE sets of separator feet are furnished, designated as "A", "B" and "C" respectively. Each set consists of three feet, one right, one center and one left, all plainly marked. The "A" feet are designed for feeding light weights of paper ranging from onion-skin to 16 pound bond; the "B" feet for medium weight stocks ranging from 13 pound up to and including light cover stocks; "C" feet for heavy weight stock such as heavy ledgers, cover stocks, blotters, tag boards, index bristols, and other heavy cardboard stocks. You will note there is a lap between the "A" and "B" feet in that both will handle stock ranging from 13 to 16 pounds. Within this range preference should be given the "A" feet, resorting to the "B" feet only when the "A" feet will not pick up the stock properly.

***Separator
Feet***

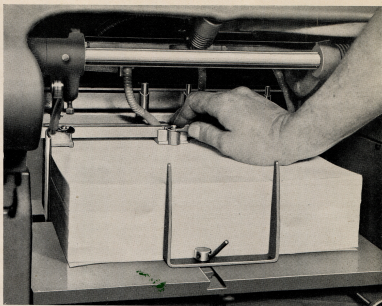
*Setting No. 3
Figure 3*

Having selected the proper feet in accordance with the foregoing instructions, place them on the separator bar in their relative positions, locating the center foot directly in the center and the left and right feet to each side, spacing them approximately the distance required to bring them to the right and left edges of the sheet to be fed. Connect the three vacuum hose with separator feet, also making sure that the short hose leading from the center separator foot is connected to the throw-off control valve. Turn the fly wheel to timing position and lower

Setting No. 3

*Adjusting
Air Vacuum
Separator Feet
(Feeder
Lowered)*

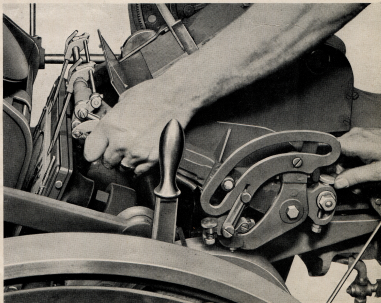
Figure 3



Setting No. 4

*Adjusting
Delivery Arm
(Feeder
Lowered)*

Figure 4



feeder. Release the stock table permitting it, together with the pile of stock, to raise to feeding position. On the 8 x 12 and 12 x 18 sizes it will be necessary to turn the fly wheel forward to permit stock table to raise after being released. Now readjust left and right separator feet as close to the edge of the pile as possible as shown in Figure 3. With the "A" and "B" feet it is advisable to allow them to project one-sixteenth of an inch over the edge to secure the best results in separation.

PLACE a sheet in position on the platen by hand before lowering feeder and turn press forward until delivery fingers commence to descend. When nearing the platen note if fingers clear press grippers and, if so, continue to turn press forward until arm descends to the point where delivery fingers start to open. Adjust fingers sidewise so that they set at even distance from edges of sheet, or to points where sheet lies closest to platen. To move the fingers easily along the rod release the spring tension by pressing down on the delivery finger operating lever. With gripper wrench loosen lock-nut located at lower end of delivery arm below the thumb adjusting screw. Now grasp the arm with left hand as illustrated in Figure 4 and with right hand adjust thumb screw as pictured, raising or lowering the arm so that top part of finger overlaps the top edge of sheet about $\frac{1}{16}$ ". Turn press forward until delivery fingers grip the sheet observing from the underside if it is the proper bite—about $\frac{1}{8}$ ". Under speed this will increase to about $\frac{1}{8}$ " which is the maximum bite practical when feeder is operated up to speed. When proper adjustment is attained, tighten delivery arm lock-nut securely. The set screw adjustment which controls clearance between delivery fingers and platen, located on tappet bracket, should never be disturbed after it is set by factory demonstrator, unless through accident or when a re-adjustment becomes absolutely necessary.

Delivery Arm

*Setting No. 4
Figure 4*

TURNING the press slowly by hand, note as the feed rack travels out over the platen if grippers clear the side and bottom feed guides. At this point, with aid of pressman's key, adjust the left gripper so that it passes over the tympan about one-quarter inch to the right of the side guide and to the left of the left hand bottom guide. Adjust the right gripper so that it passes to the right of the right hand bottom guide, clearing it about one-sixteenth of an inch. If right register is used simply reverse these instructions. The two center grippers should never be moved from their fixed position in center of rack, otherwise obstruction will be encountered with center separator foot. When feeding onion-skin or extremely light stock it will be necessary to remove the small springs inside center gripper plungers, otherwise buckling of sheet will occur as it enters the register fork. On the 12 x 18 size these springs should also be removed from end or side grippers when feeding onion-skin.

Feed Grippers

*Setting No. 5
Figure 5*

TURN the press forward until feed grippers reach the limit of their travel at bottom of platen with delivery fingers and sheet in position as shown in Figure 6. Adjust front jogger plate to within one-quarter inch of bottom edge of sheet and the two side fingers directly up to it.

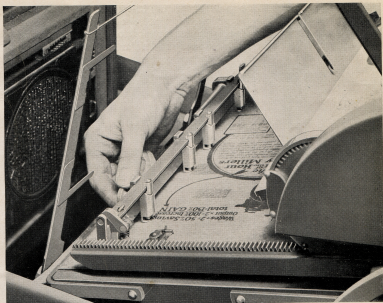
Jogger

*Setting No. 6
Figure 6*

Setting No. 5

Adjusting
Feed Grippers
(Feeder
Lowered)

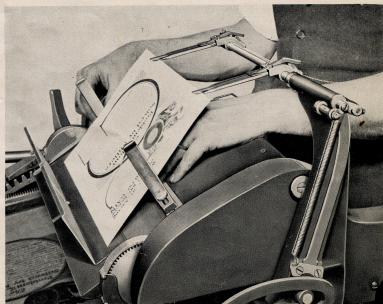
Figure 5

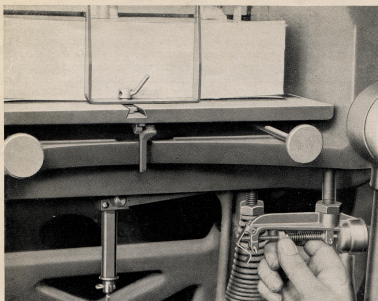


Setting No. 6

Adjusting
Jogger
(Feeder
Lowered)

Figure 6





Setting No. 7

*Adjusting the
Vacuum
Release
Valve*

Figure 7

BEFORE applying the power turn the press over slowly by hand checking up all adjustments carefully, noting particularly that feed grippers have proper clearance, that tail end of register fork is not projecting far enough to come in contact with form or rollers and that press grippers do not interfere with action of the delivery fingers. As the press is started under power loosen thumb-nut on the valve as illustrated in Figure 7, until all tension is removed from the small coil spring. When press attains the speed you wish to maintain throughout the run slowly turn up thumb-nut, gradually increasing tension on spring until separator feet pick up sheet; at this point a very slight additional tension should be applied by turning thumb-nut about one-quarter additional turn. Ordinarily no further adjustments are required other than keeping stock table supplied with properly trimmed stock and removing the printed sheets from the jogger.

**Vacuum
Release
Valve**

*Setting No. 7
Figure 7*

TO aid sheet separation and prevent separator feet picking up more than one sheet at a time, an air pressure vent is provided on the front stock plate. The amount of blast may be regulated by a pet-cock mounted on the feeder base. No blast is required for bond papers or light weight book stocks. It is used when feeding onion-skin, mimeograph paper, antique book papers and heavy stocks. The regulating of this blast is a matter of judgment—a little experimenting will set you right. If paper does not separate easily due to being trimmed with a dull knife or because of sticking of ink from a previous run, it should be loosened by jogging or rolling, before stacking on stock table.

**Air
Blast**

The foregoing instructions, if carefully followed, will insure successful operation of the feeder under all ordinary conditions imposed by the varying grades and weights of stock.

Operating Aids

OFTENTIMES conditions imposed by out-of-the-ordinary stock necessitate resorting to special adjustments or other treatment in order to facilitate feeding. In the following paragraphs we have taken up, in their order, the most common of the troubles usually encountered. The remedies suggested apply in a general way, and are broad enough in their scope to suggest ways and means for overcoming almost any out-of-the-ordinary conditions which may exist.

When Separator Feet Fail to Pick Up Sheets

This trouble may be due to any one or more of the following causes:

Insufficient vacuum, which may be traced to

First—Dirty pump (should be cleaned at least twice a year);

Second—By hose leak, remedy obvious;

Third—Dirty valves, method of cleaning given under heading "Cleaning Valves".

Air blast adjustment may not be suited to stock. Requires more or less blast, depending upon conditions.

Stock cut with a dull knife which welds the edges together, or sheets stuck together from ink used on previous run; remedy is to roll or wind the lift.

Porous nature of stock, or because of highly glazed finish, necessitating extra suction concentrated in a lesser number of holes in the separator feet. This is accomplished by pasting strips of paper over some of the holes. Method of applying these pasted strips is given under heading "Pasting Paper on Separator Feet." Stocks usually requiring this treatment are light poster or colored print, cover papers, post card and bristols, blotters, soft porous book, heavy enameled book and tissues.

When Separator Feet Pick Up Two or More Sheets

This trouble may be due to the same causes which prevent separator feet picking up the sheet. The same remedies will apply as given in foregoing paragraphs and in the following paragraphs headed "Cleaning Valves", "Pasting Paper on Separator Feet" and "Gluing Strips of Emery Cloth on Front Stock Guide".

Cleaning Valves

Vacuum Release Valve. Disassemble vacuum release valve and carefully clean with rag and gasoline. Soak leather washer in Neatsfoot oil and reassemble. Shellac or ink placed on the threads of valve cap will make it air tight.

Throw-Off Valve. If center separator foot fails to pick up the sheet, it is an indication of a leaky hose, or the throw-off valve is clogged with dirt, which prevents it from seating properly. To clean, remove from the feeder; disassemble plunger lever and before removing the plunger, mark it so that it may be replaced in the same position—a necessary precaution. When cleaning, employ only the fingers and a clean rag to avoid scratching. When replacing the plunger, to make sure that you have it in the correct position, draw air through the pipe hose, and if the plunger stays up when air vent is closed with the tongue, it is O. K. If it fails to stay up, turn the plunger half way around. If it then does not

operate properly, adjust it to the position where it works the best and tap on it gently to reseat it. When replacing the valve, make sure that end of the plunger lever properly enters the small hole in automatic throw-off finger, and tighten valve in place, exercising care that the plunger lever works freely when screws are turned up securely. If it should bind, loosen the screws and tap the valve gently to one side or the other, re-tightening the screws in this position. Use oil very sparingly on the throw-off valve and on the other valves which control the vacuum; apply oil with finger.

Control Valve. To clean this valve, compress spring and remove pin from roller. Pull plunger from valve body, clean with rag saturated with gasoline. With a piece of bent wire loosen dirt in valve, taking care not to scratch it on the inside. Blow out all loosened dirt with aid of rubber tube. Oil control valve sparingly, as an over accumulation of oil mixed with the dust which is sucked through this line will cause it to become clogged in a short time.

Pasting Strips of Paper and Cardboard on Separator Feet

If the properly selected separator feet fail to pick up sheet, after all regular adjustments have been made and air regulated in accordance with previous instructions, it may then, when feeding heavy stocks, be necessary to paste a piece of gummed paper over two of the holes on each foot to concentrate the vacuum. When using a "B" center foot, only one hole should be closed, otherwise throw-off valve will not function properly. Under very adverse conditions it is sometimes advisable to place a "C" foot in the center with "B" feet on the ends, pasting strips over the holes as instructed.

If separator feet pick up two or more sheets paste a strip of cardboard on heel of foot opposite row of holes. For light paper use 6-ply cardboard and for heavier paper use lighter cardboard. In some instances, instead of placing one strip of cardboard on heel of foot it is better to paste narrow strips of cardboard on each side of foot flush with outside edges. If, after doing this the feet fail to pick up the sheet, paste gummed paper over the two center holes on each foot. On "C" feet it is sometimes necessary to paste light cardboard over entire foot and cut an opening about $\frac{1}{16}$ " x $\frac{3}{4}$ " in the two outer feet. The center foot should have opening about $\frac{3}{4}$ " square, necessary to allow throw-off valve to work freely. After pasting on the cardboard and making the holes, paste a narrow strip of cardboard or blotter stock on the heel of each foot.

Gluing Strips of Emery Cloth on Front Stock Guide

To prevent picking up two sheets when feeding Mimeograph and other porous papers, and also coated stocks, it is sometimes helpful to glue two strips of medium emery cloth $\frac{3}{4}$ " wide to front stock guide in an upright position. These strips should be located about four inches apart, one on each side of air vent.

When Sheet Fails to Enter Feed Grippers Properly

This trouble may be traced to curled stock. Remedy is to place the lifts on table with curl down and to use extra separator feet. Hose need not be attached to extra feet.

When running onion-skin paper, if the separator bar lifts the sheet too high, it will buckle against the feed grippers and will not properly enter the register fork. To keep this thin paper flat the separator bar should be lowered or extra separator feet added—sometimes both.

If cardboard is raised too high, it will cause the feed grippers when closing on sheet to pull it away from center separator foot, thus releasing the air. This throws plunger in throw-off control valve out of time, which in turn throws off the impression. In this case the separator bar should be lowered or extra separator feet added, or both.

The separator bar may be adjusted up or down by means of the eccentric roller pin on left-hand rock lever. In right-hand end of this pin there is a slot for a screw driver. Loosen set-screw holding roller pin, insert screw driver on right-hand side and turn eccentric to raise or lower separator bar. Be careful not to push roller pin out of position with screw driver.

When Feed Grippers Fail to Carry Sheet to Guides

When running heavy cover paper or cardboard the two center rack grippers will press more firmly on the sheet if Miller Auxiliary Feed Gripper Springs are used or if rubber bands are run over the top in the notches of the brass plunger down around the rack and up over the top of the gripper.

When Sheet Rebounds from Register Fork as Feed Grippers Deliver It

When this trouble occurs the two outer prongs are not set tight enough or the sheet may be buckling because lower guides are not properly set and exactly in line.

When Sheet Cuts Under Center Prong of Fork

This trouble may be due to not having center prong of fork set snug to tympan. Cut a "V" in drawsheet in front of fork to hold edge of sheet up.

If Sheet Bounces Back from Side Guide or Wrinkles

These troubles are due to improper setting of the register fork and gauges. Remedy, follow instructions on setting fork and guides.

When Delivery Fingers Fail to Deliver Sheet

When sheet strips from form late, or if paper is curled it will go between delivery fingers more easily if a strip of heavy paper is pasted under the top piece of the finger so that it projects a trifle from end of finger. This paper fender is given an upward curl. Moving parts of fingers should be oiled occasionally, else they may stick.

When trouble is caused by manner in which sheet is stripped from form, it may be necessary to reduce the ink and add to stripping devices. See "Stripping Sheet from Form".

If Sheets will not Lay Flat in Jogger

Paste sandpaper against inside of front of frame to keep edges from crawling upward.

Setting the Throw-Off

The feeder must be up with press open and rollers at lowest point of travel. See that throw-off rod is properly attached to socket on back eccentric shaft of press. To do this, loosen hollow set screw in socket and at the same time see that the plunger is in the other end of the rod at the lower extremity of the press throw-off lever. Pull throw-off lever forward as far as possible for an impression. This will push the throw-off rod up into the socket. Tighten the screw in this position. Set the little finger opposite the plunger at the lower end of throw-off handle so that it rests about $\frac{1}{4}$ " upon the latch and parallel with it. Pull this finger back towards you until it releases the plunger in throw-off rod and raises plunger high enough so it will not drag on throw-off rod when press is running. Tighten set-screw in finger. The two little nuts on the end of the throw-off connecting rod should be tightened with the finger while the adjustment is tested by lowering the feeder and running a few sheets through. If the sheets pass through and impression is made, cut off the air. If impression is still on, the little finger is too high and should be lowered by means of the nuts on the end of throw-off connecting rod. If it does not make an impression and the paper goes through, then the finger is too low and should be raised by means of the nuts. When the adjustment is right, lock the nuts securely.

Cleaning the Feed Grippers

When removing the feed grippers for cleaning be sure to replace them just as they were. Dots at the back distinguish them. The left one has one dot and the others follow consecutively by number of dots to the right. Their springs differ on the 8 x 12 and 10 x 15, the two center springs being wound closer than the outer ones. (On late feeders all springs are alike.) The two brass plungers with nicks in the top go in the middle. On the 12 x 18 the springs and plungers are all alike. When running onion-skin or extremely light stocks the springs in the rack grippers must be removed to avoid tearing the sheet.

Care of Pump

The pump should be kept well oiled, especially the piston. The pump strap, connecting the piston to the crank-shaft of press, is adjustable by means of the nuts which hold the pump strap together. This strap should be adjusted when a knock develops. The press shafts are not all perfectly round, so when adjusting pump straps be sure that shaft revolves freely. Pump should be cleaned at least every six months. In continuous operation the pump will become quite warm. There is no danger of sticking, however, if kept well oiled.

Stock Table Adjustment

The spring which raises the stock table carries it upward to the highest point with ordinary load of paper. When very heavy loads are on the stock table, the tension on spring may be increased with the three-step table lift adjustment. The gripper wrench fits this adjustment, which may be turned to either the right or left.

Stripping Sheet from Form

When the sheet refuses to strip from the form by ordinary means, the trouble may be traced to use of an ink which is too viscous or has too much "tack" or pull. More often the trouble is encountered when running large solids on coated or other smooth finished paper or cardboard, but it sometimes occurs on other work where margins do not permit ample gripper hold.

Ordinarily inks are made for use at temperature of 60° Fahrenheit. If it is colder, the ink becomes more viscous and the stripping troubles increase correspondingly.

Inks for platen presses range in viscosity downward from: Bookbinders ink to soft Gordon half-tone ink. Where an exact color value is to be maintained, too much change in the ink must be avoided but in most instances the inks, excepting soft Gordon half-tone ink, may be reduced with the ink named next in order to it. Thus we would reduce bookbinders ink with cover ink, cover ink with bond ink, bond ink with job ink, job ink with Gordon half-tone ink, and Gordon half-tone ink with soft Gordon half-tone ink. The foregoing method of softening ink for easier stripping is not practical in many plants for colored inks, because of limited ink stock carried. So it is necessary to use a reducer, other than softer inks. Many reducers are used, such as boiled oil, petrolatum and various specially prepared compounds, but the best and least costly reducer is kerosene. If used sparingly it will not affect the color or luster of the ink nor does it retard drying. If the pressroom is very cold, heat must be used together with kerosene. A kerosene or gas stove may be placed close to press. The ink and kerosene should be warmed before mixing.

If reducing does not help to strip sheet from form, the sheet must be made to peel more slowly from upper edge of form. This may be accomplished with strings between grippers, but the strings must be so placed that they are between the form side of grippers and the form. Miller Hold-Fast Grippers and String Fasteners provide a simple, efficient remedy for stripping troubles.

Make-ready Hints

REALIZING that a properly applied make-ready contributes largely to the successful operation of Miller Feeders, as well as to the quality of the output, we offer the following make-ready hints as supplementary to the instructions applying directly to the care and operation of our machines. A careful make-ready insures constant, uninterrupted operation, while a slovenly, hastily applied make-shift will cause serious annoyance and frequent stops throughout the run.

Packing

The packing, about .047 inch, should consist, for the most part, of very hard material of uniform thickness and flat so that the drawsheet may be kept taut. Whether the major portion of the packing shall consist of pressboard or sheets of photo-engravers' copper, zinc, or brass or celluloid is a matter of choice. The minor portion of the packing is made up of S. and S. C. paper with a manila drawsheet over all.

The S. and S. C. sheets and the drawsheet are changed for each form if the runs are of considerable length. The permanent packing is placed next to the platen when beginning make-ready. Three or four sheets of S. and S. C. and a sheet of manila, of proper size to clear the bed bearers of the press and to afford ample grip by the tympan bales at upper and lower ends of platen, are secured first under upper and next under lower bale. The upper bale is raised and the drawsheet rolled back under grip-ers, where it remains during make-ready.

Rollers

The rollers, roller trucks and roller tracks on each side of bed should be kept in working shape. The tracks should be type high and the trucks just enough less in diameter than the rollers to allow the form to be inked well. The rollers should always have the pins at each end of the core which engage in the slots in roller trucks. Have roller maker replace these pins if broken, as they are necessary to keep the rollers revolving while traveling over the form.

If the rollers and ink are not right all the make-ready falls short of securing results. The rollers should have "tack" at all times and be firm but not hard and glossy. When roller loses its "tack", the ink remains on the plate and the print is lifeless. The trouble may be overcome with an electric fan or heat. Sponge the rollers with a saturated solution of tannic acid in alcohol, sponging the ends as well as the face of the roller. Sometimes the roller will be efficient for days after a tannic acid bath, at other times the bath must be given daily, depending on the humidity.

Rollers which have been carelessly washed gradually take on an invisible film of grease and ink which greatly reduces their efficiency. Such rollers may be made as good as before by washing the film off with a rag and crude carbolic acid and washing a second time with kerosene or gasoline. Hard, dry ink may be removed after months and years, even, from rollers, plates and type forms with the same detergent, crude carbolic acid, which is not an acid but an oil. Other detergents which accomplish the same result without spoiling the face of roller are carbon tetrachloride, sulphuric ether, acetone, chloroform and formaldehyde.

Test the diameter of rollers occasionally with a roller gauge which may be made by filing face of large type down two points. The bottom of this gauge is placed on the bed of press and the roller should touch the filed face. Within certain limits make-shifts may be used to overcome shrinking and expansion, underlaying the form or gluing strips of cardboard on roller tracks. The cardboard strips should be beveled at upper and lower ends.

Inking of a solid form is readily done by means of two Miller Vibrators or one Miller Vibrator and Miller Roller Tripping Truck on bottom roller.

Form

The base of make-ready is a type-high form. Every pressman should have a type-high gauge and a micrometer and every plant doing considerable plate printing should have a Miller Saw-Trimmer for accurately trimming wood bases of plates. The wood may be sand papered down but this wastes time and is not accurate as the edges are naturally made lower with sand paper. Plates with vignette edges should be two points less than type-high; perforating or other sharp rule should be less than type-high.

Interlay

If the form consists of type and plates or plates alone the first step is to make the plates type-high and absolutely level. While the underlay is quickest and most used, the interlay is more effective, especially in vignette plates. Slamming wood base on iron or stone lock-up table or bed of press will

loosen brads so they may easily be removed with pliers. File off burrs on bottom of plate. The interlay should bevel off from center to edges with no paper at all under the edge and a nonpareil inside of edge. It is possible in many cases to make-ready vignette plates without interlay, provided you start with edges under type-high, but the interlay is better for long runs.

Overlay

On the general run of commercial work the trial impression for overlay (after the form has been made type-high) is pulled on enough sheets of S. and S. C. to get a clear print on four corners of form. Use barely enough ink. If an excess of ink is used while overlaying you may find the print light in spots after starting the run, which would necessitate stopping to patch up the overlay.

After you get a print that is legible at the four corners, turn the sheet over and hold it, reverse side up, at an angle between your eyes and the light, so that you can clearly see the marks made by the impression on the reverse of the sheet. Study the impression peculiarities on printed side of sheet. You will note the impression grows weaker toward center of form by degrees or graded steps, not easily defined but perceptible to the close observer. With a lead pencil mark on the reverse of sheet an oval or circle which bounds all the area inside of the clear impression and within this oval mark two or three smaller ovals, as may seem necessary to define the degrees of impression. These ovals are next covered with glazed onion-skin tissue paper, a little paste being used as adhesive. The rough side of tissue is laid on the sheet with the glazed side up. With a sharp knife trim the tissue to the edges of the ovals. The smallest oval is covered first and the others in consecutive order according to size.

Pull an impression on the top sheet of S. and S. C. paper under the bales and paste the overlay sheet in register on it. Pull another trial impression on one sheet less than used before. You will likely find the impression not quite clear in spots. Turn sheet at an angle to light again and mark ovals on reverse of sheet to bound the areas which print light. These ovals are overlaid with thin tissue .001 inch thick. Register this overlay on top of the first one. Pull another trial impression on one less number of sheets than before. Examine print carefully. There may be a defective letter or other character here and there which needs a patch of tissue to make it print well defined. When the form prints well all over, place your hard packing over the overlay, draw the drawsheet down over the hard packing and secure drawsheet under bale at top of platen.

If the form consists of new type only the print should be sharp and clear with no impression showing on the reverse of sheet. If the type is old the hard packing should be buried beneath one or two sheets of S. and S. C.

This make-ready will answer for a solid form of type of the same or about the same size. If there are lines of heavy black-face type each line of the heavier type will require a patch of onion-skin tissue. If there are sharp rules in the form, these should be cut out of one sheet of the overlay sheets.

In printing half-tones where the subject is well-defined, with high-light surroundings such as sky, the entire subject should be overlaid with French folio. The impression ovals are covered with thin tissue when overlaying plates and the graduations of impression for half-tones and solids are made with patches of onion-skin tissue. After the plate prints clear and sharp all over pull an impression on sheet of coated or other stock to be printed. Now trim away all of this sheet outside of the print. Use a sharp knife and cut exactly to edges of print. Paste the print in register on a sheet of S. and S. C. secured under both bales and next below drawsheet. This cut-out print acts like an embossing die and removes the impression from edges of plate, while causing it to print much better and to continue to print during a long run.

Distribution

Platen presses should be equipped with Miller Vibrator Roller for heavy forms and Miller Roller Tipping Trucks for bottom roller, as the full inking capacity of press can not be obtained without these devices.

Embossing

Embossing is quickly and easily done on Gordon presses by using repressed fiber blanket for the male die. This renders hot embossing obsolete, also the use of various slow setting embossing compounds. To emboss with this blanket, attach a sheet of three-ply cardboard to bare platen with shellac (much better than glue) and then attach fiber side of blanket to cardboard with shellac. Pull trial impressions. You may underlay the female die if embossing is not deep enough. When ready to print, fasten quads for gauges to the bare platen or sheet of cardboard as preferred.

Do not have female die etched too deep for weak papers, such as coated stocks, as the paper will break where embossed. When you are to emboss a type form, electrotpe the form, have embossing die made from electro and print from the electro for embossing. Be sure the electro is securely locked in chase and the chase immovable in bed of press and take the same precautions when embossing.

Register on embossing jobs is best obtained by keeping the press grippers out of contact with the sheet during both printing and embossing operations. Miller Hold-Fast Grippers, with Auxiliary Grippers form the most efficient device for this purpose. The sheet may be held secure at impression by gluing corks a pica thick to cardboard fender beside bottom guides.

Picking

Sometimes when printing solid plates the ink will "pick" and the printed sheets can not be stripped from the form. When making ready, use scant supply of ink. Then follow methods outlined in paragraphs headed "Stripping Sheets from Form".

Mottling

Mottling of ink is caused by using an ink not viscous enough for the paper. Use an ink with more "tack". For instance, when printing a plate on hard, smooth paper if the ink used is half-tone ink and it mottles, the addition of job ink will overcome the mottling. Add half-tone ink to soft half-tone ink, job ink to half-tone ink, bond ink to job ink and cover ink to bond ink.

Gloss Varnish

The most satisfactory way to get the highest possible gloss on embossed and printed covers and the like is to make a second impression with gloss varnish without lifting the form from press. Use a good cover ink for printing. In many cases a priming impression must be made with cover white. This means three printings where a very bright color with highest gloss must be secured on a dark cockle-finish or absorptive paper. Sometimes to get a glossy impression of cover white, three impressions are made with cover white and one with gloss varnish, without lifting the form.

Slurring

Slurring is caused when the form is not parallel to the platen. Again you may have to run a heavy cut out of center or in a corner of the chase on a press previously set for light forms. This would also necessitate resetting of the screws to avoid slurring. We run into this when we get a very heavy form or plate locked up so that its heaviest solids are at the top of chase (because more ink is laid on the upper part of a heavy form by the rollers).

An ink without sufficient "tack" causes slur. Perhaps slurring is oftentimes met with in printing sharp rules as boundaries of a parallelogram or in printing widely separated rules. The trouble is aggravated if the paper used is curly and gripper bite impossible owing to lack of or very narrow margin. Corks will sometimes stop this slurring but even corks can not be used when running sharp rules around a hollow square. Nothing can be placed inside the square to stop the slur. There is but one remedy in such a case. Make ready with underlays only and print on the platen itself or a thin sheet of bristol board shellacked to the platen.

Offset

Offset makes considerable trouble at times. There are several causes of offset: (1) static electricity, (2) too much ink, (3) wrong ink for paper used, (4) too much impression marking on the reverse of the sheet. The remedies are obvious. Eliminate the causes. If the stock is well seasoned and warm in cold weather and the pressroom kept warm night and day by means of double doors and windows and exclusion of drafts of cold air and the air supplied with ample moisture, there will be next to no static electricity. It is often caused by dragging cold paper into a hot pressroom and having draughts of cold, dry air blowing into a hot room.

Running close to color is advisable at all times to avoid offset and is possible only with thorough make-ready. A little experimenting will prove that ink not suited to the paper, form and speed of press will cause offset when other conditions are right. If the impression is so strong that it is legible on the reverse of the sheet it is bound to scratch the ink off of face of sheet beneath—a very common cause of offset.

Cleanliness

In plate printing, whether in one or more colors, care must be used to keep the ink clean during long runs, else the print will be marred with specks of dry ink. At quitting time the steel fountain roller should have all of its exposed surface washed. In the morning before starting the press, the portion of this roller covered by ink in fountain should be washed, otherwise the film of gummy or even dried ink will be worked on the plate and rollers and appear in the print as specks.

Crystallization of Inks

In multi-color printing when an ink will not print or "take" on a previously printed ink it may be known that the ink first printed has dried too hard or "crystallized". The second ink may be made to take by adding a compound to be had of ink maker.

